

DOWNHOLE DATA TRANSMISSION SYSTEM

Abstract

A system for transmitting data through a string of downhole components. In one aspect, the system includes first and second magnetically conductive, electrically insulating elements at both ends of the component. Each element includes a first U-shaped trough with a bottom, first and second sides and an opening between the two sides. Electrically conducting coils are located in each trough. An electrical conductor connects the coils in each component. In operation, a varying current applied to a first coil in one component generates a varying magnetic field in the first magnetically conductive, electrically insulating element, which varying magnetic field is conducted to and thereby produces a varying magnetic field in the second magnetically conductive, electrically insulating element of a connected component, which magnetic field thereby generates a varying electrical current in the second coil in the connected component.